

What we claim is:

1. A communication system having a plurality of node devices for communicating with a terminal, said terminal
5 may move among said plurality of node devices and register its location with said communication system, said location being an address of a destination node device accommodating said terminal, comprising:

a location registering server for registering the
10 location of said terminal, and

a node device that receives a packet destined for said terminal and transfers said packet to the destination node device when knowing the address of the destination node device, while otherwise transferring the packet to the
15 destination node device by referring to the location registering server.

2. The communication system as claimed in claim 1, further comprising:

20 a transfer sequence, wherein when the node device does not know the address of the destination node device, the received packet is transferred to the destination node device by the node device forwarding the received packet to the location registering server which forwards
25 the packet to the destination node device by referring to a location registering table.

3. The communication system as claimed in claim 2 wherein the location registering server further forwards
30 the address of the destination node device to the node device.

4. The communication system as claimed in claim 3 wherein the node device forwards a received subsequent packet directly to said destination node device

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5. The communication system of claim 1 further comprising:

a source node device being an originating node device of said received packet, and

10 a transfer sequence, wherein when the node device does not know the address of the destination node device, the received packet is once sent back to the source node device by the node device, and by referring to the location registering server the packet is transferred to the
15 destination node device.

6. The communication system of claim 5 wherein the source node device obtains the address of the destination node device from the location registering server and
20 transfers the packet to the destination node device.

7. The communication system of claim 5 wherein when the received packet is being once sent back to the source node device, the received packet is transferred by the node
25 device to the location registering server which forwards the received packet back to the source node device.

8. The communication system as claimed in claim 5 wherein the location registering server further forwards
30 the address of the destination node device to at least one of the source node device and the node device.

9. The communication system of claim 1 further comprising:

5 a source node device being an originating node device of said received packet, and

a transfer sequence, wherein when the node device does not know the address of the destination node device, the received packet is once sent back to the source node device by the node device, the source node device transfers
10 the packet to the location registering server, which further transfers the received packet to the destination node device by referring to a location registering table.

10. The communication system of claim 9 wherein when the
15 received packet is being once sent back to the source node device, the received packet is transferred by the node device to the location registering server which forwards the received packet back to the source node device.

20 11. The communication system as claimed in claim 9 wherein the location registering server further forwards the address of the destination node to the source node device.

25 12. The communication system of claim 9 wherein the location registering server further forwards the address of the destination node device to the node device.

13. The communication system of claim 1, further
30 comprising:

a transfer sequence, wherein when the node device

does not know the address of the destination node device,
the address of the destination node device is obtained from
the location registering server so that the received
packet is transferred by the node device to the destination
5 node device at the obtained address.

14. The communication system of claim 13 further
comprising:

a sender node device being a node device that sent
10 the packet, wherein
said node device further notifies the sender node
device of the address of the destination node device.

15. The communication system of claim 1 wherein said node
15 device further comprising:

a storage portion for storing an address of the
terminal and the address of the destination node device
in correspondence with each other, and

a transfer portion for transferring the received
20 packet to the destination node device when the terminal
is not being accommodated by the node device.

16. The communication system as claimed in claim 15
wherein the node device continues transferring packets to
25 the destination node device after the received packet
until a predetermined time elapses or a finish of the
packet transfer is instructed.

17. A communication system having a plurality of node
30 devices for communicating with a terminal, said terminal
may move among said plurality of node devices, comprising:

a destination node device being a node device of said plurality of node devices that is accommodating the terminal and facilitating communication between the terminal and the communication system; and

5 a former node device being a node device of said plurality of node devices that previously accommodated the terminal; wherein

the destination node device obtains an address of the former node device and notifies the former node device of an address of the destination node device and an address
10 of the terminal.

18. The communication system of claim 17 wherein the terminal comprises:

15 a storage portion for storing the address of the former node device; wherein

the destination node device receives the address of the former node device stored in the storage portion and by way of the received address of the former node device
20 notifies the former node device of the addresses of the destination node device and the terminal.

19. The communication system of claim 18 wherein the storage portion of the terminal stores the address of the
25 former node device with which the terminal has first started communication during a communication session.

20. The communication system of claim 18 wherein the storage portion of the terminal stores all addresses of
30 former node devices servicing areas where the destination terminal has been located from a communication start to

a present time, and

the destination node device receives said all
addresses from the storage portion of the terminal to
notify all of the former node devices of the addresses of
5 the destination node device and the terminal.

21. The communication system of claim 18, said destination
node device further comprising:

a storage portion for storing the address of the
10 former node device and the address of the terminal in
correspondence with each other, and

the destination node device notifying the former node
device, by referring to its storage portion, of an address
of a new destination node device, when

15 the terminal has moved from an area in which the
destination node device accommodates the terminal to an
area of a new destination node device, said new destination
node device having the area where the terminal is located
at present, and

20 the new destination node device has notified the
destination node device of the address of the new
destination node device and the address of the terminal.

22. A communication system having a plurality of node
25 devices for communicating with a terminal, said terminal
may move among said plurality of node devices, comprising:

a destination node device being a node device of said
plurality of node devices that is accommodating the
terminal and facilitating communication between the
30 terminal and the communication system;

a former node device being a node device of said

plurality of node devices that previously accommodated the terminal; and

5 a location registering server having a location registering table and for notifying the former node device of the address of the destination node device and the address of the terminal based on the address of the former node device registered in the location registering table, the address of the former node device being registered in the location registering table before receiving a location registration request from the destination node device and the terminal.

23. A communication system having a plurality of node devices for communicating with a terminal, said terminal may move among said plurality of node devices, comprising:

a destination node device being a node device of said plurality of node devices that is accommodating the terminal and facilitating communication between the terminal and the communication system;

20 a former node device being a node device of said plurality of node devices that previously accommodated the terminal; and

a location registering server having a location registering table,

25 wherein the location registering server registers the location of a first destination node device, being a node device with which the terminal has first started communication during a communication session, and

when receiving a location registration request of a latest destination node device and the terminal, during the communication session, the location registering

server does not register the latest destination node device in the location registering table, and

notifies the first destination node device of the address of the latest destination node device and the
5 terminal.

24. The communication system of claim 17, the communication system further comprises:

a location registering server, wherein
10 the destination node device obtains, from the location registering server, the address of the former node device to notify the former node device of the addresses of the destination node device and the terminal.

15 25. The communication system of claim 24 wherein the destination node device, when the terminal has moved to an area accommodated by the destination node device and before making a location registration of the terminal, obtains from the location registering server the
20 address of the former node device to notify the former node device of the addresses of the destination node device and the terminal, the former node device having an area where the terminal was located before.

25 26. The communication system of claim 17, the communication system further comprises:

a location registering server which further comprises:

a storage portion for storing the address of the
30 former node device, wherein the location registering server notifies the former

node device of the address of the destination node device to which a location registration request from the terminal is being made.

5 27. The communication system of claim 17, the communication system further comprises:

a location registering server which further comprises:

10 a storage portion for storing the address of the former node device, wherein

while the terminal continues a communication session the storage portion of the location registering server stores the address of the first former node device being a node device where the terminal started the communication
15 session, and

the destination node device notifies the first former node device of the addresses of the destination node device and the terminal.

20 28. The communication system of claim 17, the communication system further comprises:

a location registering server which further comprises:

25 a storage portion for storing all addresses of former node devices where the terminal has been located from a communication start to a present time, and

the location registering server notifies all of the former node devices of the address of the destination node device and the address of the terminal.

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29. The communication system of claim 17, the

communication system further comprises:

a location registering server which further comprises:

a storage portion for storing the address of the
5 former node device, wherein
the destination node device receives the address of
the former node device from the location registering
server, when the terminal has moved to an area accommodated
by the destination node device, to notify the former node
10 device of the addresses of the destination node device and
the terminal.

30. The communication system of claim 17, the
communication system further comprises:

15 a location registering server which further
comprises:

a storage portion for storing the address of the
former node device, wherein

while the terminal continues a communication session
20 the storage portion of the location registering server
stores the address of the first former node device being
a node device where the terminal started the communication
session, and

the destination node device notifies the first former
25 node device of the addresses of the destination node device
and the terminal.

31. The communication system of claim 17, the
communication system further comprises:

30 a location registering server which further
comprises:

a storage portion for storing the address of the former node device, wherein

the storage portion of the location registering server stores all addresses of former node devices where
5 the terminal has been located from a communication start to a present time, and

the destination node device notifies all of the former node devices of the addresses of the destination node device and the terminal.

10

32. A communication system having a plurality of node devices for communicating with a terminal and a location registering server, said terminal may move among said plurality of node devices and register its location with
15 the location registering server, comprising:

a destination node device being a node device of said plurality of node devices that is accommodating the terminal and facilitating communication between the terminal and the communication system;

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a sender node device being a node device of said plurality of node devices that sends or forwards a packet to a node device of said plurality of node devices; and

a transfer sequence, wherein the node device receiving the packet notifies the sender node device of
25 an address of the destination node device and an address of the terminal when knowing the address of the destination node device, while otherwise notifying the location registering server whereby the address of the destination node device and the address of the terminal registered in
30 the location registering server is provided to the sender node device.

33. The communication system of claim 32 wherein the sender node device is a node device that received the packet from a sending terminal.

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34. The communication system of claim 32, wherein the node device further comprising:

a storage portion for storing the address of the destination node device, wherein

10 the node device notifies the sender node device of the address of the destination node device and an address of the terminal by referring to the storage portion.

35. The communication system of claim 32 wherein

15 the node device transfers the received packet to the location registering server and requests the location registering server to notify the sender node device of the address of the destination node device and an address of the terminal.

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36. The communication system of claim 32 wherein

the node device transmits, to the location registering server, a message for requesting the location registering server to notify the sender node device of the address of the destination node device and an address of the terminal.

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37. The communication system of claim 32 wherein

30 the node device obtains the address of the destination node device from the location registering server and notifies the sender node device of the address

of the destination node device and an address of the terminal.

38. A communication system having a plurality of node
5 devices for communicating with a terminal, said terminal
may move among said plurality of node devices, comprising:

a destination node device being a node device of said
plurality of node devices that is servicing an area where
the terminal is located and having an address;

10 a sender node device being a node device of said
plurality of node devices that sends or forwards a packet
and having an address; and

a transfer sequence, wherein the destination node
device notifies a sender node device of its own address
15 and an address of the terminal based on an address stored
in a storage portion provided in at least one of the
terminal and the destination node device.

39. The communication system of claim 38 wherein the
20 terminal has a storage portion for storing the address of
the sender node device, and

the destination node device receives the address of
the sender node device from the terminal to notify the
sender node device of its own address and the address of
25 the terminal.

40. The communication system of claim 38, further
comprising:

a location registering server; wherein
30 the terminal has a storage portion for storing an
address of a source terminal, and

the destination node device transmits, to the location registering server, a message including the source terminal address received from the terminal and its own address, and requests the location registering server
5 to notify the sender node device of the addresses of the destination node device and the terminal.

41. The communication system of claim 38, further comprising:

10 a location registering server; wherein
the destination node device has a storage portion for storing the address of the sender node device,
when the terminal has moved to an area not serviced by the destination node device, the destination node
15 device receives, from a latest node device, being a node device servicing an area to which the terminal has moved, an address of the latest node device and the address of the terminal through the location registering server, the destination node device notifies the sender node device
20 of the addresses of the latest node device and the terminal.

42. The communication system of claim 38, wherein the terminal has a storage portion for storing an address of
25 a node device servicing an area where the terminal was located, and

the node device having a storage portion for storing the address of the sender node device, wherein the node device receives, from the destination node device, the
30 addresses of the destination node device and the terminal, and the node device notifies the sender node device of the

addresses of the destination node device and the terminal.

43. The communication system of claim 38, further comprising:

- 5 a location registering server;
 the terminal having a storage portion for storing an address of a node device servicing an area where the terminal was located; and
 the node device having a storage portion for storing
- 10 an address of a source terminal, wherein
 the destination node device transmits a message to the node device including its own address and the address of the terminal, based on the address stored in the storage portion of the terminal,
- 15 the node device receives said message and transmits, to the location registering server, a message including the address of the destination node device, the address of the terminal, and the address of the source terminal stored in the storage portion of the node device, and
- 20 requests the location registering server to notify the sender node device servicing the source terminal of the addresses of the destination node device and terminal.

44. The communication system of claim 38, further comprising:

- 25 a location registering server, having a storage portion for storing the address of the sender node device, wherein
 when the terminal moves to an area serviced by the
- 30 destination node device the destination node device transmits, to the location registering server, a message

including its own address and the address of the terminal,
and requests the location registering server to notify the
sender node device of the addresses of destination node
device and the terminal.

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45. The communication system of claim 38, further
comprising:

a location registering server, having a storage
portion for storing the address of the sender node device,
10 wherein

when the terminal moves to an area serviced by the
destination node device the destination node device
transmits an inquiry to the location registering server
requesting the address of the sender node device, and the
15 destination node device directly notifies the sender node
device of its own address and the address of the terminal.

46. The communication system of claim 38, further
comprising:

20 a location registering server, having a storage
portion for storing an address of a source terminal in
correspondence with the address of the terminal, wherein

when the terminal moves to an area serviced by the
destination node device the destination node device
25 transmits, to the location registering server, a message
including its own address and the address of the terminal,
and requests the location registering server to notify the
sender node device of the addresses of destination node
device and the terminal.

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47. The communication system of claim 46, further comprising:

5 a plurality of location registering servers, wherein when the location registering server receives the message from the destination node device and the location registering server does not have the address of the source terminal stored in its storage portion, the location registering server requests another location registering server in which the source terminal is registered to notify
10 the sender node device of the addresses of the destination node device and the terminal.

48. The communication system of claim 38, further comprising:

15 a location registering server, having a storage portion for storing an address of a source terminal in correspondence with the address of the terminal, wherein when the terminal moves to an area serviced by the destination node device the destination node device
20 receives from the location registering server an address of the source terminal and an address of a source node device servicing the area where the source terminal is located, and directly transmits, to the sender node device, its own address and the address of the terminal.

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49. The communication system of claim 1, wherein the terminal having a storage portion included in an adapter connected to the terminal.

30 50. The communication system of claims 1, wherein a packet transmitted/received between the plurality of node

devices designates to the destination node device at least one of a necessity of a transfer of its own packet, a transfer destination, a necessity of a response message, and a response destination.

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51. The communication system of claims 1, wherein a message transmitted/received between the plurality of node devices designates, to the destination node device, at least a necessity of a response message and a response
10 destination.

52. The communication system of claims 1, further comprising:

15 a plurality of location registering servers; and
the node device having a server retrieval table for providing a correspondence between the terminal and an address of a location registering server where a terminal location registration is made.

20 53. The communication system of claims 1, wherein the node device is connected to a router to compose the communication system.

25 54. The communication system of claims 1, wherein the node device is connected with an ATM-SWITCH to compose the communication system.

55. The communication system of claims 1, further comprising a plurality of terminals, wherein at least one
30 of the terminals has a fixed terminal, and
at least one of the node devices has a node device

for a fixed communication network.

56. A node device of a communication system for
accommodating communication to a terminal, and the
5 communication system having a location registering server
and a destination node device which is a node device
accommodating the terminal, said node device comprising:

a unit for receiving a packet destined for the
terminal;

10 a notifying unit for notifying a source node device
of the received packet of an address of the destination
node device and an address of the terminal when knowing
the address of the destination node device, while
otherwise notifying the location registering server
15 whereby the address of the destination node device
registered in the location registering server and the
address of the terminal is provided to the source node
device.

20 57. The node device of claim 56, wherein the source node
device is a node device that received the packet from a
source terminal.

58. The node device of claim 56, further comprising:

25 a storage portion for storing the address of the
destination node device, wherein

the node device notifies the source node device of
the addresses of the destination node device and the
terminal by referring to the storage portion.

30

59. The node device of claim 56, wherein

the node device transfers the received packet to the location registering server and requests the location registering server to notify the source node device of the addresses of the destination node device and the terminal.

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60. The node device of claim 56, wherein the node device transmits, to the location registering server, a message for requesting the location registering server to notify the source node device of the addresses of the destination node device and the terminal.

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61. The node device of claim 56, wherein the node device obtains the address of the destination node device from the location registering server and notifies the source node device of the addresses of the destination node device and the terminal.

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62. The node device of claim 56, wherein a packet transmitted/received between a plurality of node devices designates to the destination node device at least one of a necessity of a transfer of its own packet, a transfer destination, a necessity of a response message, and a response destination.

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63. The communication system of claim 56, wherein a message transmitted/received between a plurality of node devices designates, to the destination node device, at least a necessity of a response message and a response destination.

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64. The node device of claim 56, further comprising:

a server retrieval table for providing a correspondence between the terminal and an address of a location registering server where a terminal location registration is made.

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65. The node device of claim 56, wherein the node device is connected to a router to compose the communication system.

10 66. The node device of claim 56, further comprising:
at least one of a unit for provide communication access for a fixed terminal.

15 67. A node device which composes a communication system with a terminal, and serves as a destination node device when servicing an area where a terminal is located, said node device being part of a communication network, said node device comprising:

20 a first communication port for communicating with the terminal;

a second communication port for communicating with the communication network; and

a controller for controlling the transmitting/receiving of messages in the first
25 communication port and the second communication port and when serving as a destination node and receiving a message for the terminal in the second communication port from a source node device, notifying the source node device of its own address and an address of the terminal based on
30 an address stored in a storage portion provided in at least one of the terminal and the destination node device.

68. The node device of claim 67, wherein
the terminal stores an address of the source node
device, and

5 the destination node device receives the address of
the source node device from the terminal to notify the
source node device of its own address and the address of
the terminal.

10 69. The node device of claim 67, wherein the communication
system has a location registering server,
the terminal stores an address of a source terminal,
and

the destination node device receives the address of
15 the source terminal from the terminal and transmits, to
the location registering server, a message including the
address received from the terminal as well as the addresses
of its own device and the terminal, and requests the
location registering server to notify the source node
20 device of the addresses of its own device and the
destination terminal where the source node device is a node
device accommodating the source terminal.

70. The node device of claim 67, further comprising:

25 a storage portion for storing, when serving as a
destination node device, an address of the source node
device, wherein the communication system has a location
registering server, and when

the node device receives, from a latest destination
30 node device having an area to which the destination
terminal has moved, an address of the latest destination

node device and the address of the terminal through the location registering server to notify the source node device of the addresses of the latest node device and the terminal when the destination terminal.

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71. The node device of claim 67, further comprising:

a storage portion for storing, when serving as a destination node device, the address of the source node device, wherein the terminal stores an address of the node device where the terminal is located, and

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when the terminal moves to a latest destination node device the latest destination node device receives the address of the node device, where the terminal was located from the terminal, and notifies the node device of its own address and the address of the terminal,

15

the node device receives the addresses of the latest destination node device and the terminal and notifies the source node device of the addresses of the latest destination node device and the terminal.

20

72. The node device of claim 67, further comprising:

a storage portion for storing, when serving as a destination node device, the address of a source terminal, wherein the terminal stores an address of the node device where the terminal is located, and the communication system has a location registering server, and

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when the terminal moves to a latest destination node device the latest destination node device receives the address of the node device, where the terminal was located from the terminal, and notifies the node device of its own address and the address of the terminal,

30

the node device receives the addresses of the latest destination node device and the terminal and notifies the location registering server of the address of the latest destination node device, the address of the terminal, and
5 requests the location registering server to notify the source node device of the addresses of the latest destination node device and terminal where the source node device is a node device accommodating the source terminal.

10 73. The node device of claim 67, wherein the communication system has a location registering server, the location registering server storing the address of the source node device, and when the terminal has moved to the node device,
the node device serving as the destination node
15 device transmits, to the location registering server, a message including its own address and the address of the terminal and requests the location registering server to notify the source node device of the addresses of its own device and the destination terminal.

20 74. The node device of claim 67, wherein the communication system has a location registering server, the location registering server storing the address of the source node device, and when the terminal has moved to the node device,
25 and

the node device serving as the destination node device inquires of the location registering server about the address of the source node device, and directly
notifies the source node device of its own address and the
30 address of the terminal.

75. The node device of claim 67, wherein the communication system has a location registering server, the location registering server storing an address of a source terminal in correspondence with the address of the terminal, and
5 when the terminal has moved to the node device,

the node device serving as the destination node device transmits, to the location registering server, a message including the its own address and the address of the terminal, and requests the location registering server
10 to notify the source node device of the addresses of its own device and the destination terminal.

76. The node device of claim 67, wherein the communication system has a location registering server, the location registering server storing an address of a source terminal in correspondence with the address of the terminal, and
15 when the terminal has moved to the node device, and

the node device serving as the destination node device receives the address of the source terminal and the address of the source node device having an area where the source terminal is located, and directly transmits, to the source node device, its own address and the address of the terminal.
20

77. A method for transferring packets in a packet communication network having a plurality of node devices for communicating with a terminal, the terminal may move among the plurality of node devices, the method comprising the steps of:
25

receiving a packet in a node device, the packet destined for the terminal;
30

determining an address for forwarding the packet to the terminal; and
forwarding the packet.

5 78. A method for transferring packets in a packet communication network having a plurality of node devices for communicating with a terminal, the terminal may move among the plurality of node devices, the method comprising the steps of:

10 receiving a location registration request from the terminal in a node device of the plurality of node devices;
determining an address of a previous node device where the terminal was previously registered; and
notifying the previous node device of addresses of
15 the node device and the terminal.

79. A method for transferring packets in a packet communication network having a plurality of node devices for communicating with a terminal, the terminal may move
20 among the plurality of node devices, the method comprising the steps of:

receiving a packet in a node device, the packet destined for the terminal;
determining an address for forwarding the packet to
25 the terminal; and

notifying a sender node device of the address for forwarding the packet to the terminal and the address of the terminal when the node device is not providing communication with the terminal, wherein the sender node
30 device sent the packet received in the node device.

80. A method for transferring packets in a packet communication network having a plurality of node devices for communicating with a terminal, the terminal may move among the plurality of node devices, the method comprising
5 the steps of:

receiving a location registration request from the terminal in a node device of the plurality of node devices;

determining an address of a source node device being a node device that is sending packets to the terminal; and

10 notifying the source node device of addresses of the node device and the terminal.